

Spaceflight Injectable Delivery System

Canceled Technology Project (2008 - 2011)



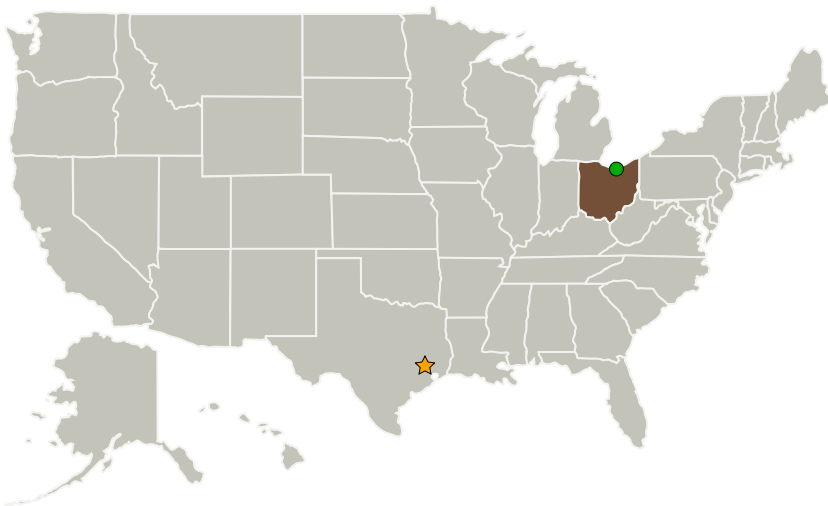
Project Introduction

In the event of an emergency during spaceflight, it may be necessary for the crew to find extended safety in their Extra-Vehicular Activity (EVA) spacesuits. During this EVA contingency, NASA requires the capability to deliver liquid medications via intramuscular injection to ill or injured crewmembers. The delivery of liquid medication in a damaged vehicle unable to maintain a habitable environment poses unique challenges. Some of these challenges include the behavior of the fluid in a low-pressure and off-nominal-temperature environment, the formation of bubbles in microgravity, and the ability to physically use the medical delivery device at the desired anatomical location while the astronaut is suited. Under the auspices of NASA's Human Research Program, the In-Suit Injection System project at the Glenn Research Center (GRC) aims to develop an injection device capable of delivering necessary medications during an EVA contingency.

Anticipated Benefits

This technology development project aims to design a medical injection device for the harsh environment of space. This technology could translate to harsh Earth environments such as during underwater diving or during a hazardous materials/chemicals scenarios requiring the user to be in a containment suit.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations

Ohio

Project Transitions

**October 2008:** Project Start**December 2011:** Project canceled because no longer relevant to the mission**Rationale:** Project canceled because no longer relevant to the mission**December 2011:** Closed out

Closeout Summary: [Editor's Note September 2012: the following from the Human Research Roadmap <http://humanresearchroadmap.nasa.gov/tasks/?i=893> ; Per the Human Research Roadmap and HRP Master Task List, the project is currently in an archived state. End date changed to 12/30/2011; original end date was 9/30/2014] The Injectables task successfully completed PDR (preliminary design review) in September of 2011. At that time, it was felt that the forward need for an injection device was too undefined to further proceed with the project. With uncertainty in the needs of the suit developers (Injectables was conceived under Constellation Program and was working under those mission scenarios), new and uncertain Design Reference Missions (DRMs), and uncertainty from the medical community on what needed to be provided because of the changing DRMs, the Injectables task was put on hold. The project is currently in an archived state that will allow for continued development if the need arises.

Project Website:

<https://taskbook.nasaprs.com>

Organizational Responsibility

Responsible Mission Directorate:

Space Operations Mission Directorate (SOMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Human Spaceflight Capabilities

Project Management

Program Director:

David K Baumann

Project Manager:

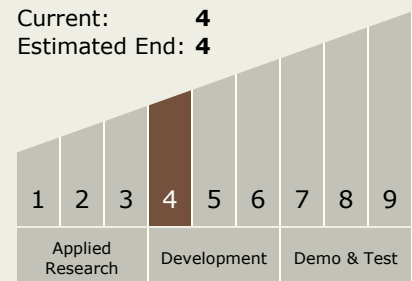
Sharmila D Watkins

Principal Investigator:

Aaron S Weaver

Technology Maturity (TRL)

Start: 4
 Current: 4
 Estimated End: 4



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.3 Human Health and Performance
 - └ TX06.3.3 Behavioral Health and Performance

Target Destinations

The Moon, Mars